

1/30

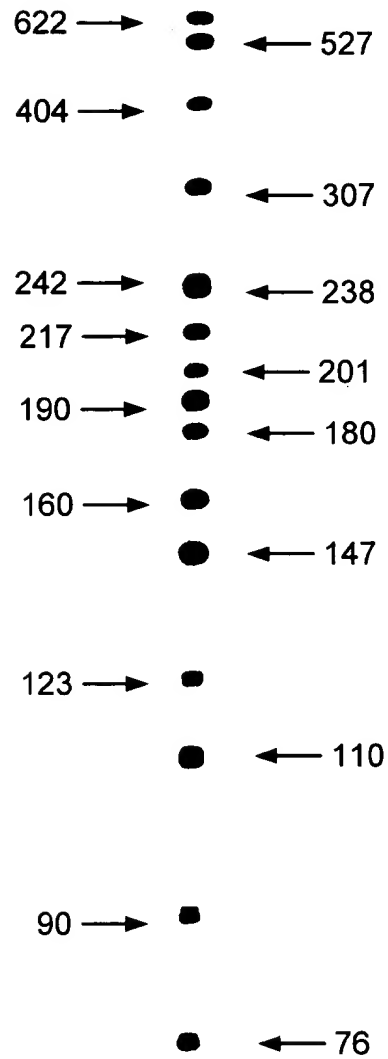


FIG. 1

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FIG. 2A

FIG. 2B

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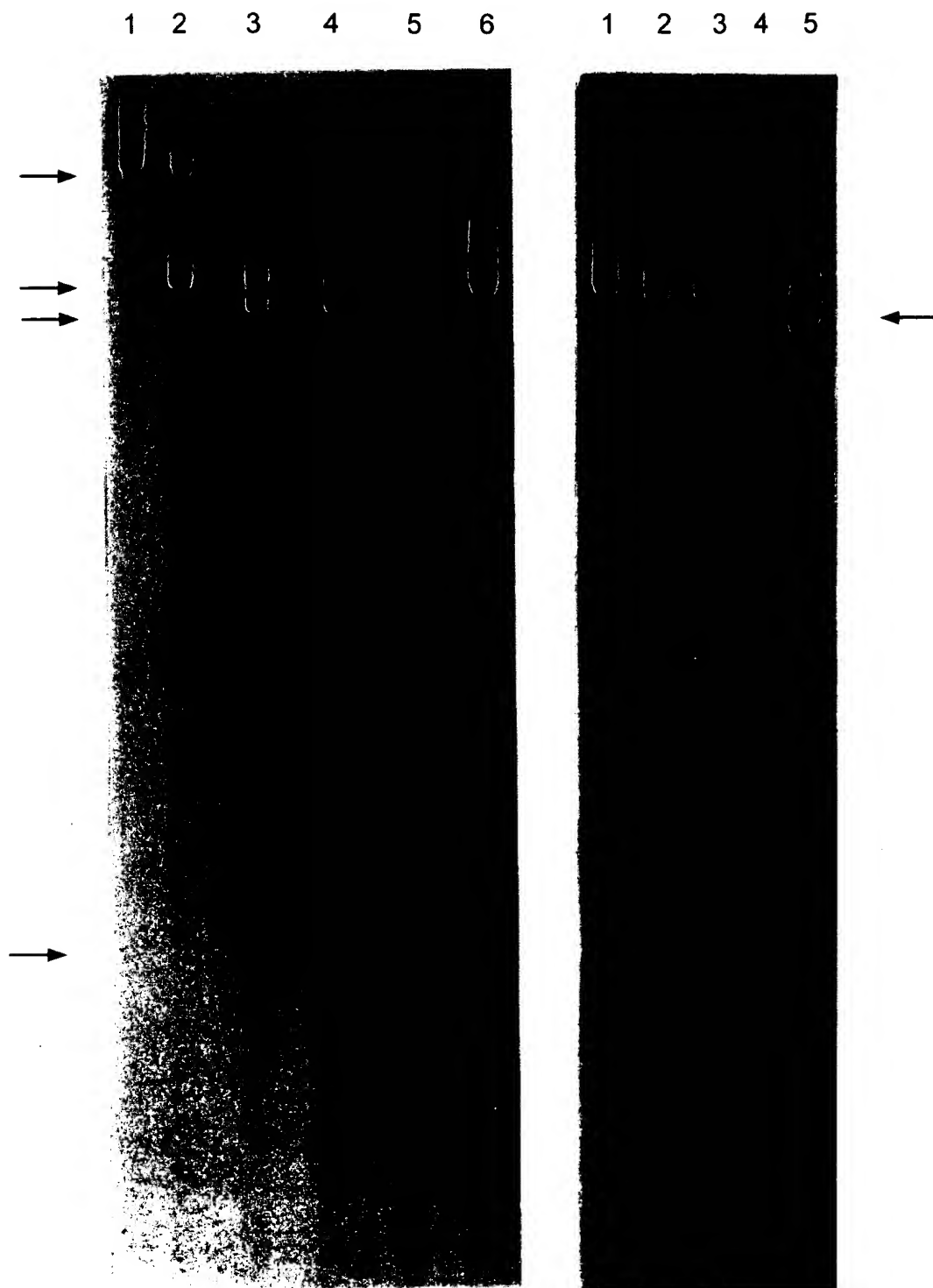


FIG. 3A

FIG. 3B

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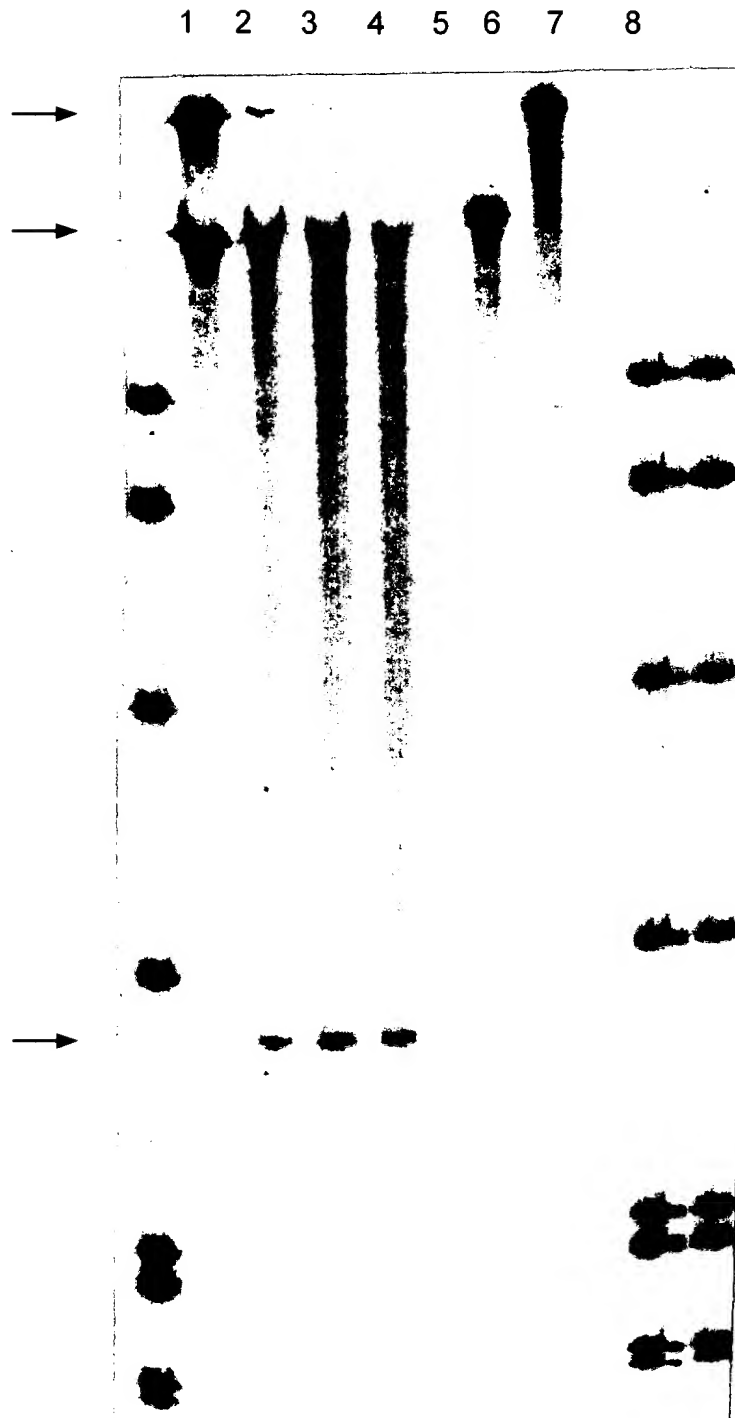


FIG. 3C

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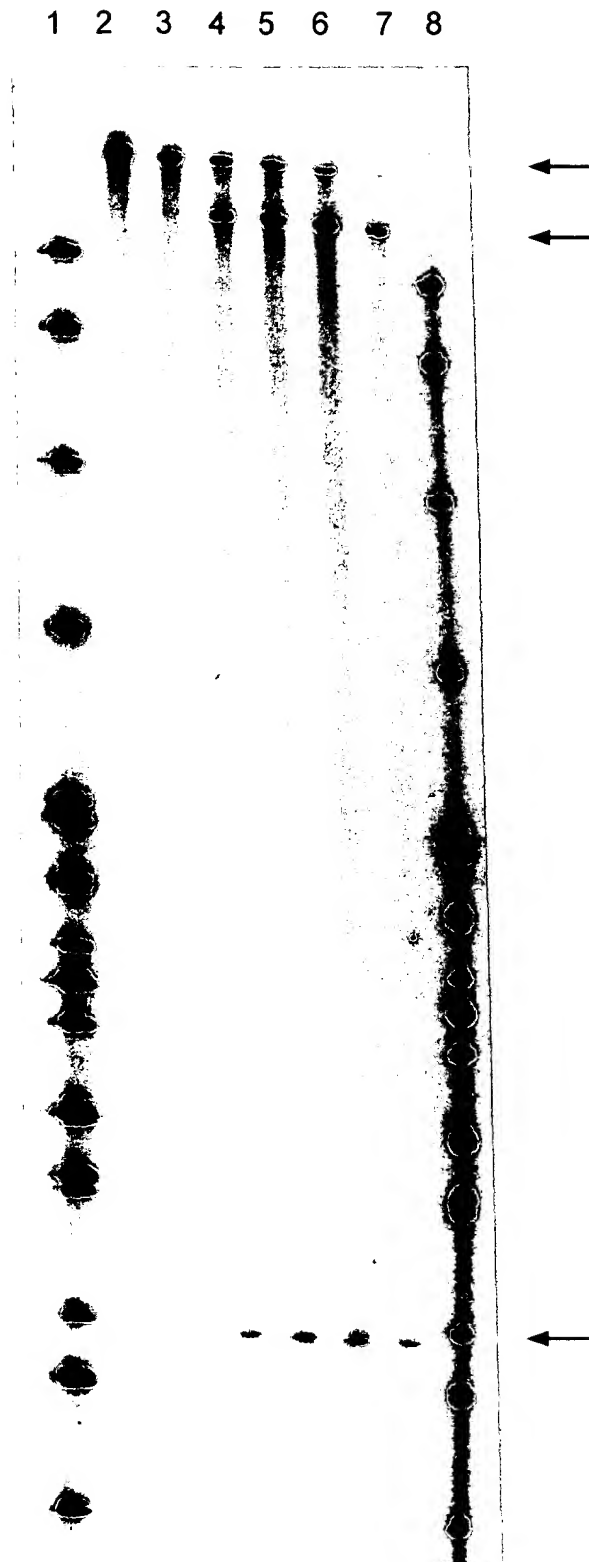


FIG. 4

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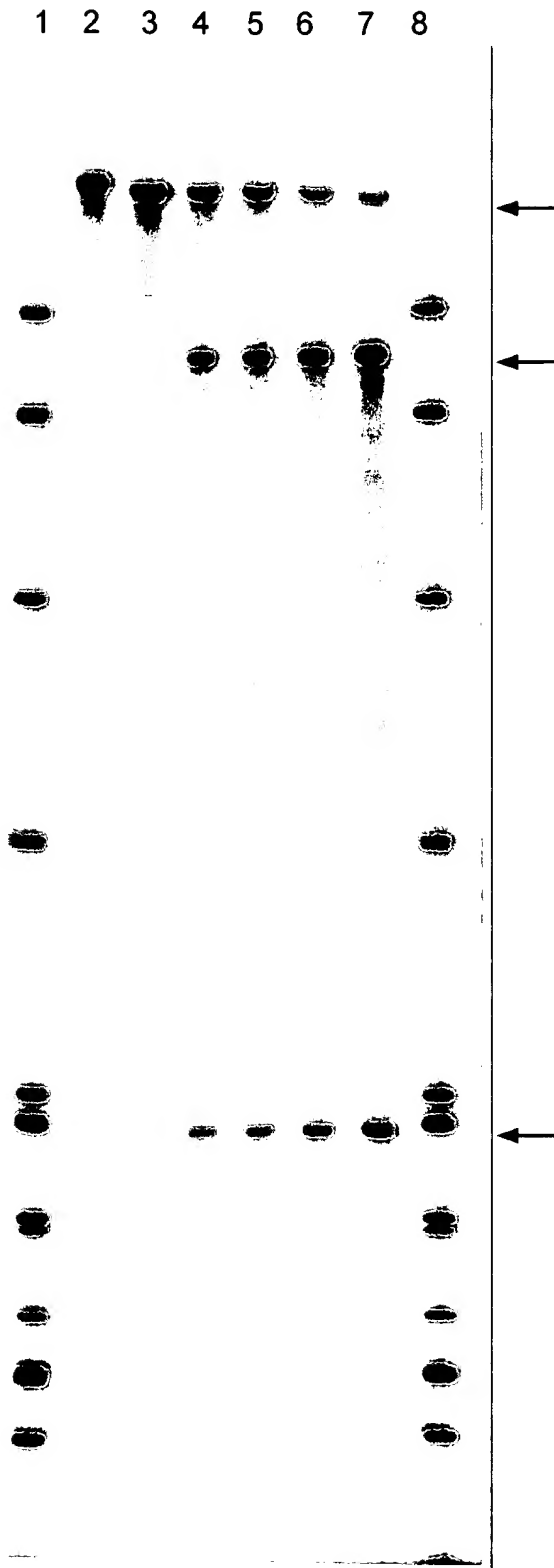


FIG. 5

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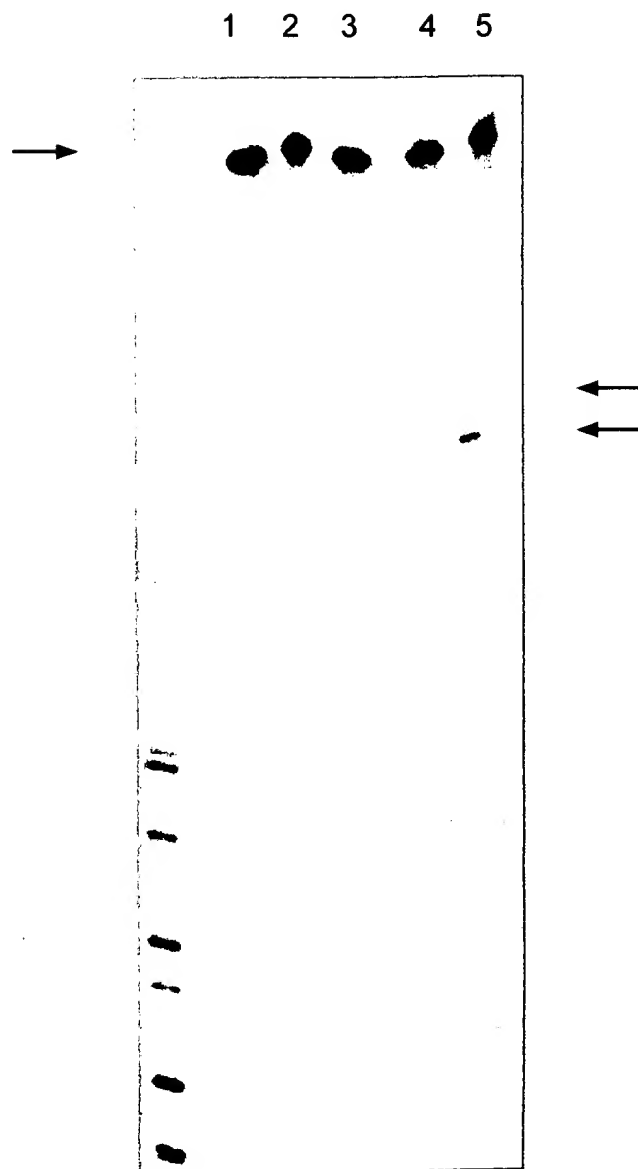


FIG. 6A

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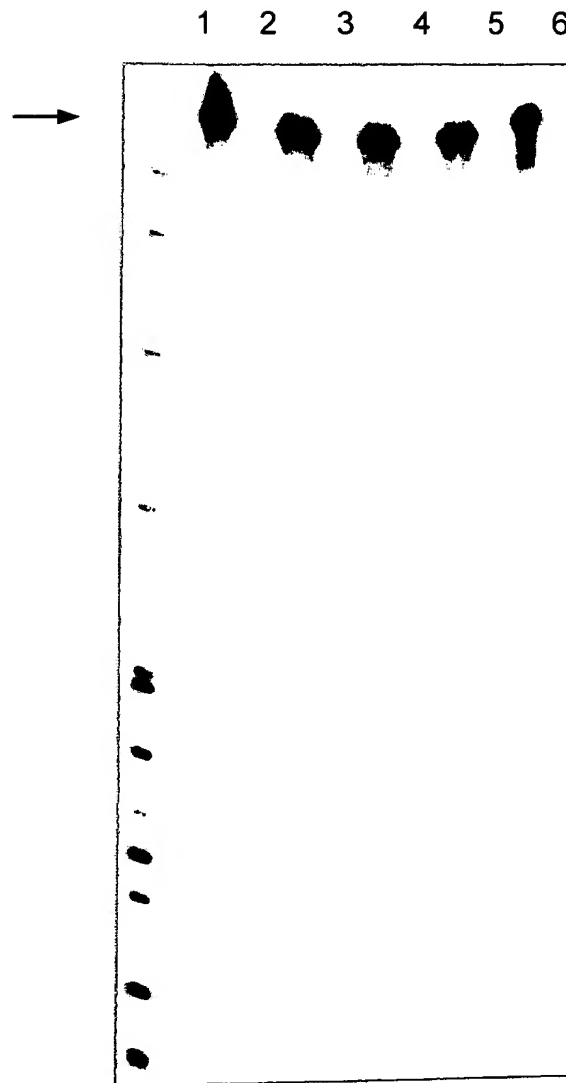


FIG. 6B



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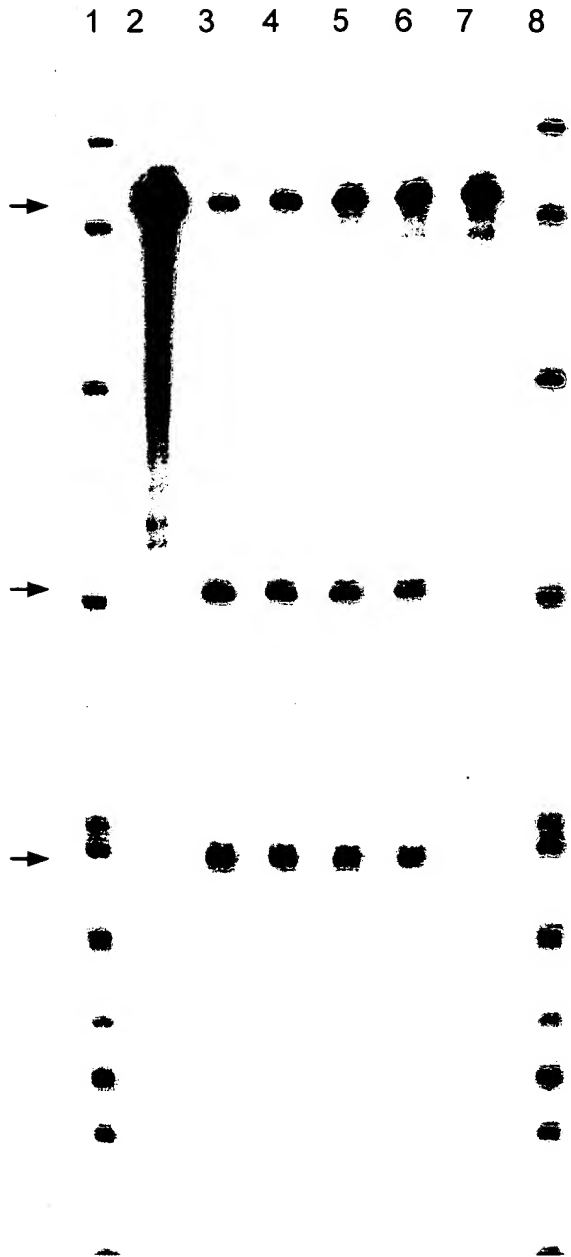


FIG. 7A

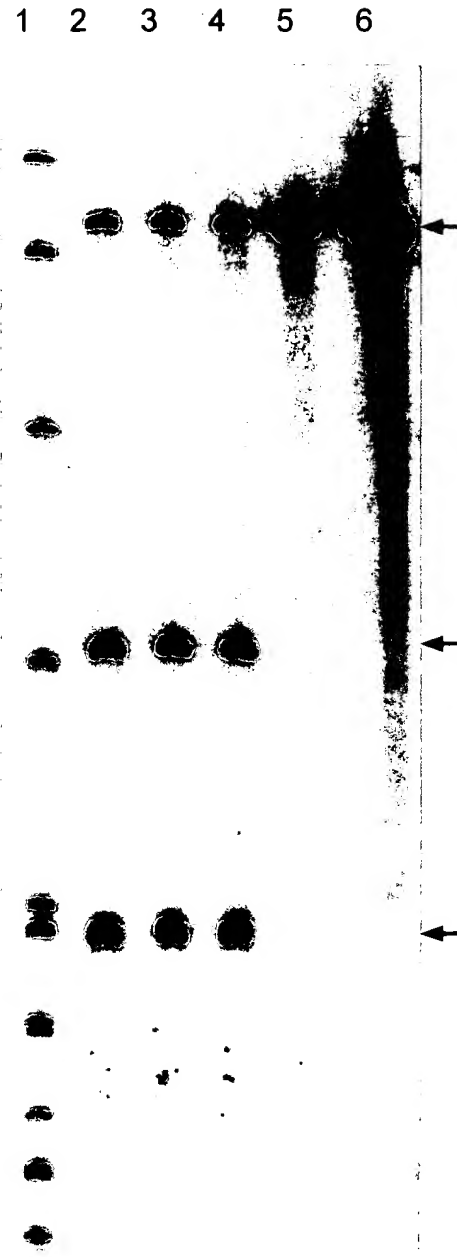


FIG. 7B

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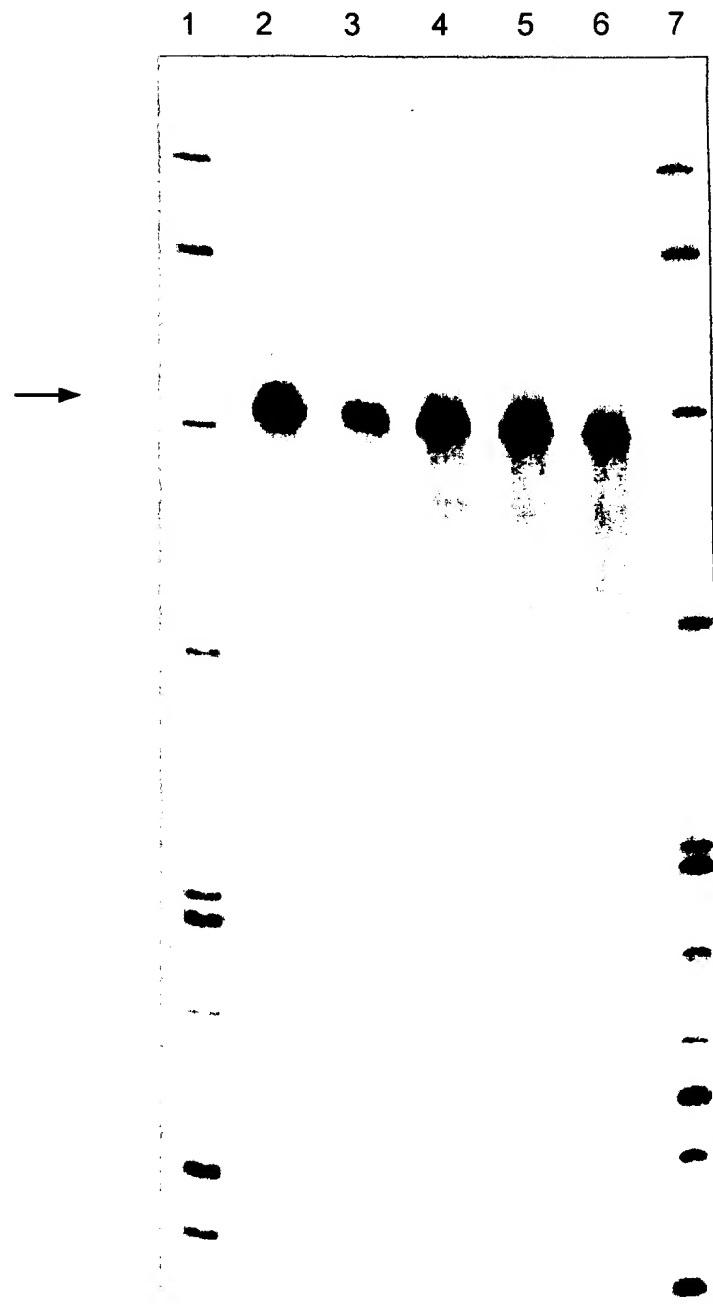


FIG. 7C

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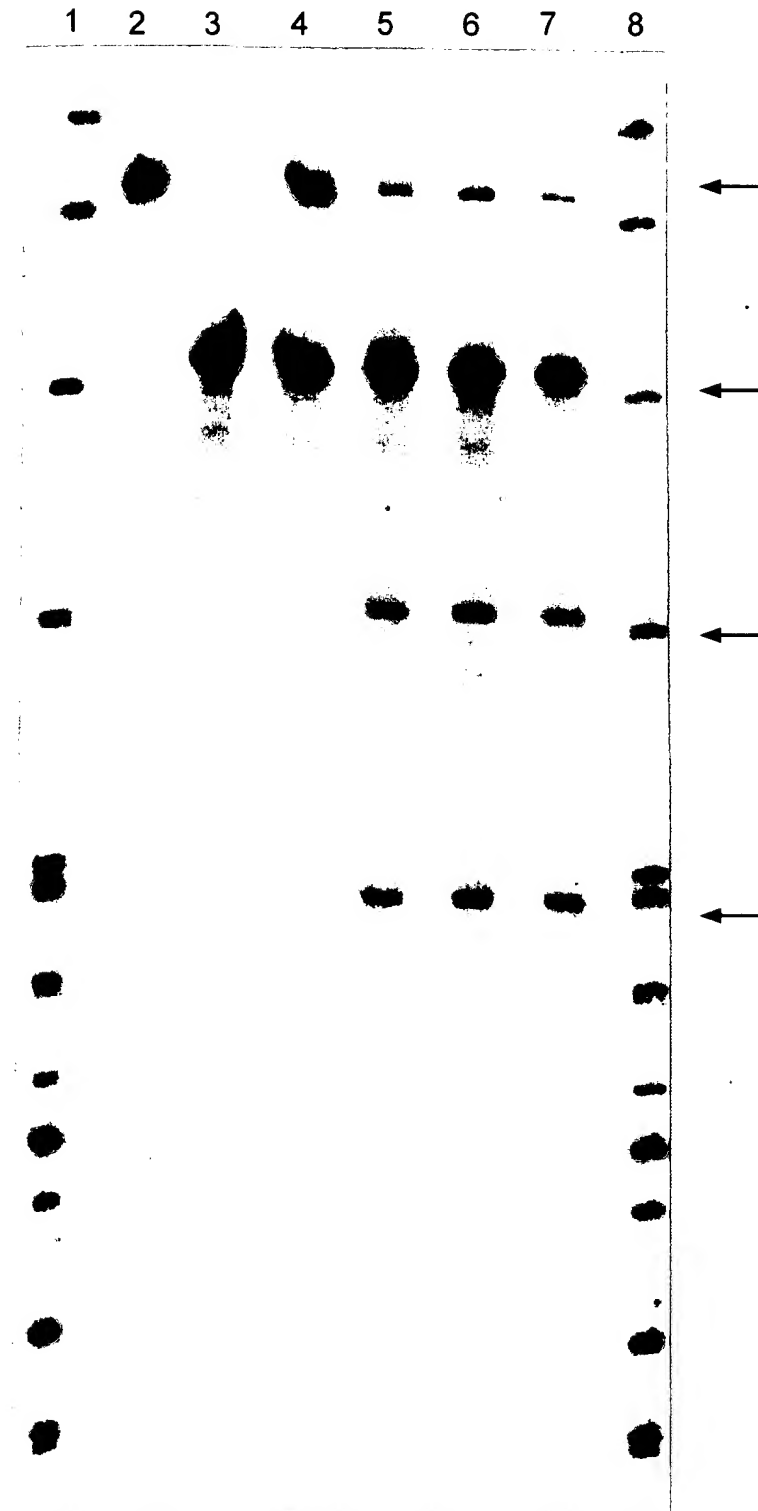


FIG. 7D

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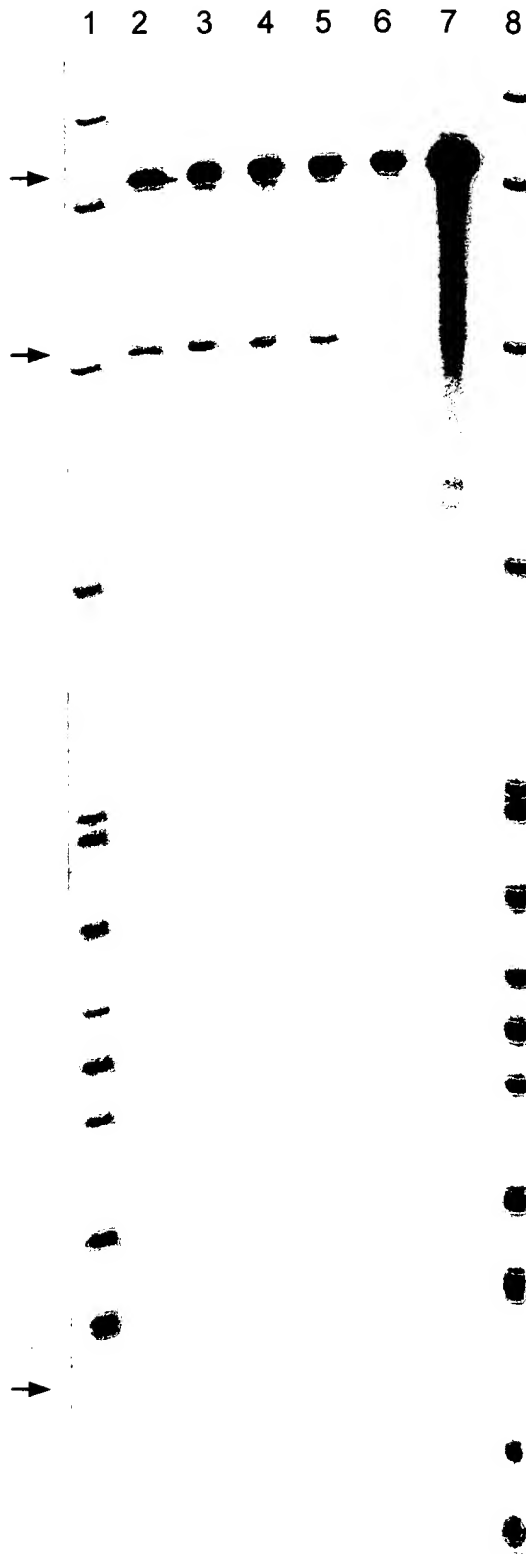


FIG. 8A

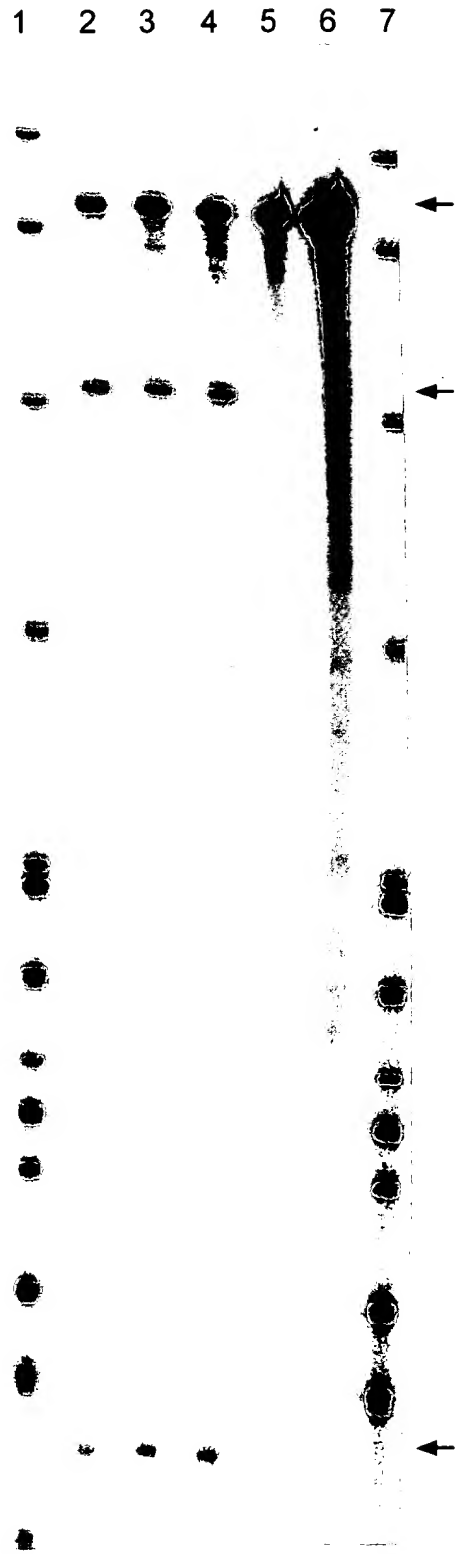


FIG. 8B

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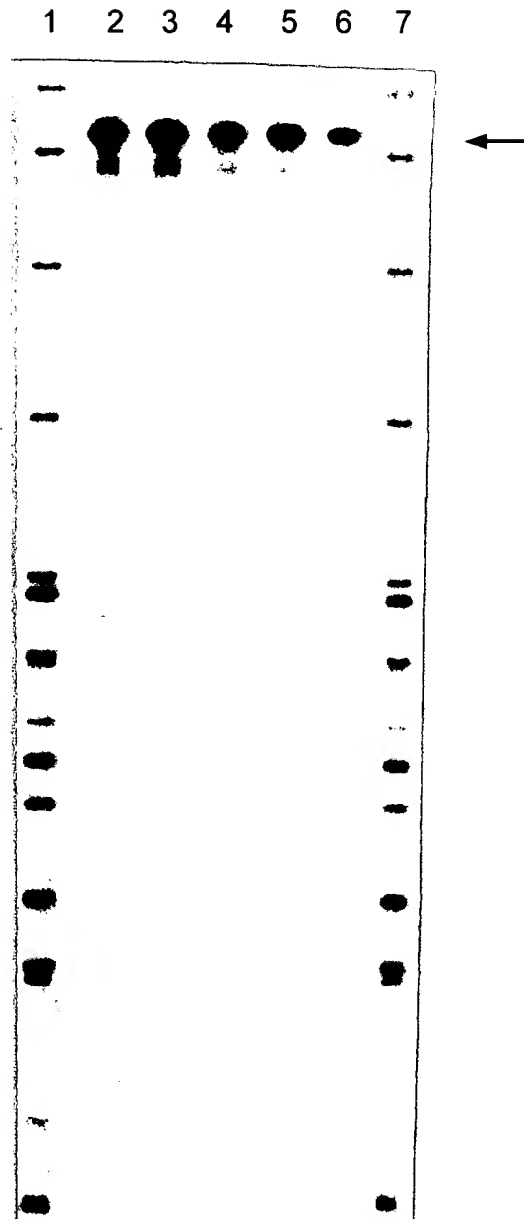


FIG. 8C

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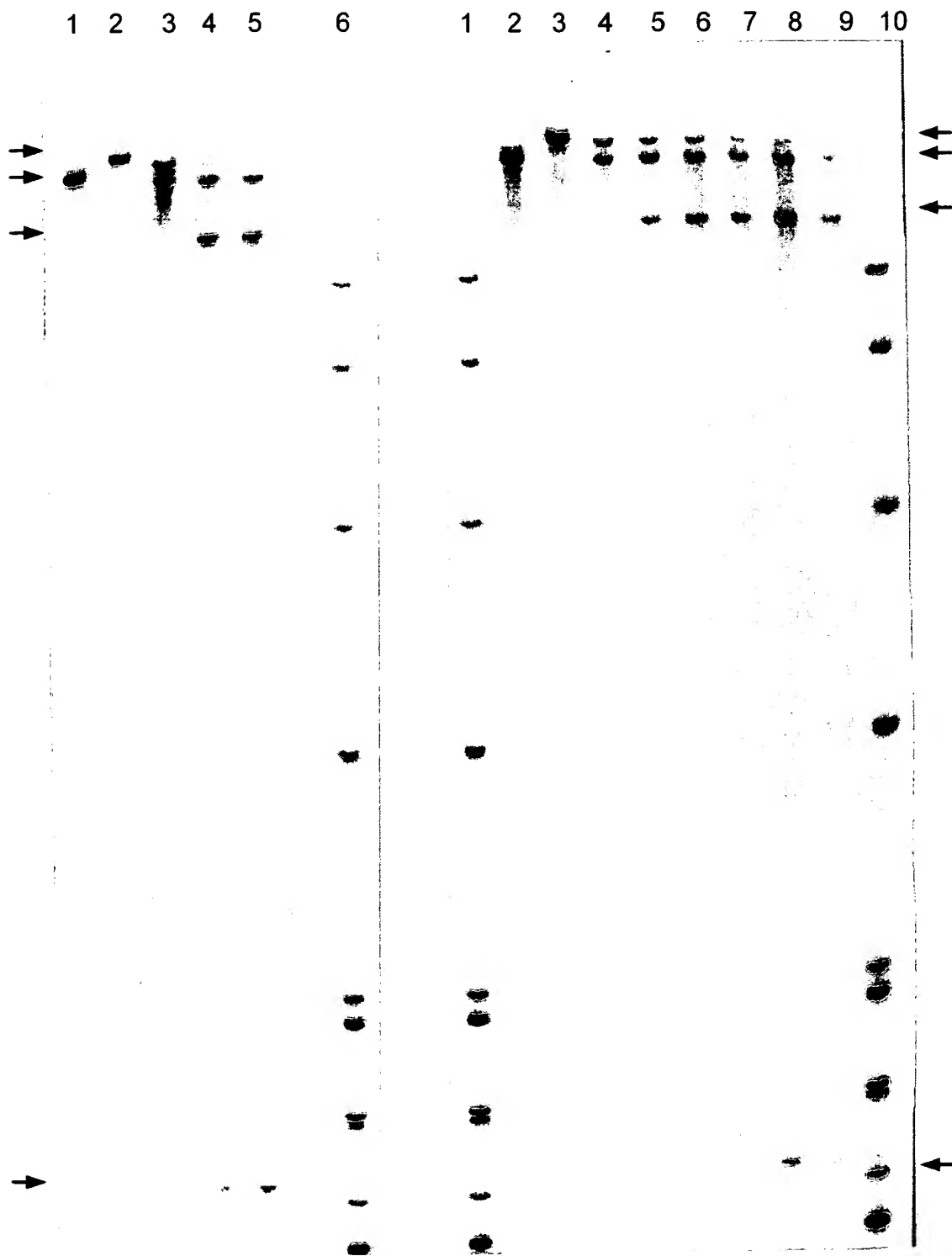


FIG. 9A

FIG. 9B

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SEQ ID NO: 1 Human Rhodospin

TCCCTTNTGNTAGATTGCANNNCCCAATAAANAAGNCCCGCTTAAAGGCTTATCGAAA  
TTAATACGACTCACTATANGGAGACCCAAAGCTTAGAGTCATCCAGCTGGAGCCCTGAGTG  
GCTGAGCTCAGGCCTTCGCAGCATCTTGGTGGAGCAGCCACGGGTGAGCCACAAGGG  
CCACAGCCATGAATGGCACAGAGGCCCTAACTTCTACGTGCCCTTCTCCAATGCGACGG  
GTGTGGTACGCAGCCCTTCGAGTACCCACAGTACTACCTGGCTGAGCCATGGCAGTTCT  
CCATGCTGGCCGCTACATGTTTCTGCTGATCGTGTGGCTTCCCCATCAACTTCCTCA  
CGCTCTACGTCACCGTCCAGCACAGAAGCTGCGCACGCCCTCTCAACTACATCCTGGCTC  
AACCTAGCCGTGGCTGAACCTCTTCAATGCTCCTANGTGGCTTACCAAGCACCTCTACANCT  
CTCTGCATGGATACTCGTCTTCGGGCCCCACAGGATGCAATTGGANGGCTCTTTGCACCTG  
GNGGAAATTCCTGTGGTCCCTNGTGCNGNCACCAACGTAAGTGGTNGTGTNTANCCC  
AGAACAACTCCGCTCCC

FIG. 10

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SEQ ID NO:2 mut447

GGNNNTTGGGTCGCCGCAATTNAAGAACTCANGGNCCCGCAGCATTTCTTGGGTGGGAGCAGCTACGGGTCAGCCACAAGGG  
CCACAGCCATGAATGGCACAGAAAGCCCTAACTTCTACGTGCCCTTCTCCAATGCGACGGGTGTGGTACGCAGCCCCCTTC  
GAGTACCCACAGTACTACCTGGCTGAGCCATGGCAGTTCTCCATGCTGCCGCCCTACATGTTTCTGCTGATCGTGTGGG  
CTTCCCCATCAACTTCCTCACGCTCTACGTGACCGTCCAGCACAAAGCTGCGCACGCCCTCTCAACTACATCCTGCTCA  
ACCTANCCGTGGNTGAACCTTTCATGGTCCTAGTGGCTTCAACANCAACCTCTANACCTCTCTGCATGGANACTTCNTC  
TTCCGGCCCCACAGGATGCAATTGGAAGGNTTCCCTTAACACCCGGGGGGGAAATTTGCCCTGTGGTCCCTTGGTGGTCCG  
GNCANCAACGGTACTTGTGGTNTTTAANCCATAAAACAATTCCGCTTCGGGAAAAACAATGCCANCNTGGGGTTTCCTTCA  
CTNGGTTANGGCGGCTGCCCCCAACCCCAATCCCNCGTNGTCAANTAAATCCCAAGGCNNANTGNCNTTTTAAACAAA

FIG. 11



SEQ ID NO:3 Pro23Leu

NNNTAGGNCGGATGTCNATATAAGCAGANCTCTCTGGGCTAACTAANAAGAACCCCACTGGCTTACTGGCTTATCGAAA  
TTAATACGACTCACTATAGGGAGACCCCAAGCTTCCGGAAGCCTGAGCTCAGCCACAAGGCCACAGCCATGAATGGCAC  
AGAAAGCCCTAACTTCTACGTGCCCTTCTCCAAATGCCAGCGGTGTGGTACGCAGCCTCTTCGAGTACCCACAGTACTACC  
TGGCTGAGCCATGGCAGTTCTCCATGCTGGCCGCTACATGTTCTGCTGATCGTGCTGGGCTTCCCCATCAACTTCCTC  
ACGCTCTACGTACCGTCCAGCACAAAGAGCTGCGCACGCCCTCTCAACTACATCCTGCTCAACCTANCCGTGGCTGAAC  
CTTCATGGTCCTANGTGGCTTCACCCANCAACCCTCTACACCTCTCTGCATGGATACTTCGTCTTCCGGGCCACAGGATGCA  
ATTGGAAGGCTTCTTTGCANCCGTGGNCGGAAATGCGCTGTNGTCCTGGTGGTCCCTGGCCATCAACNGTACTTGTGT  
NTNTTACCCCATNAACAATTCCGCTCCGGGAAACATGCACATGGGNTTGCCTCACTNGGCTCTGGGGCNGGCNCCCCACCC  
CACCCCGGTGGTCANTTATCCCANGGCGNAATGCCCTTTNANNA

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FIG. 12

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SEQ ID NO:4 RIB10a

CNGCNCGTTGAAATATAAGCAGACCCCTCTGGNTAACTANAATAACCACTGCTTACTGGCTTATCGAAATTAATACGACTC  
ACTATANGGAGACCAAGCTTGGTCGGTCTGATGAGTCCGTGAGGACGAAACGTANANTCTANAGGGCCCTATTCTATAGT  
GTCACCTAAATGCTAGANCTCGCTGATCAGCCTCGACTGTCCTTCTAGTTGCCAGCCATCTGTTGTTTCCCCCTCCCCC  
GTGCCCTTCCCTTGANCCCTGGAAGGTGCCACTCCCACTGTCCCTTCCCTAATAAAATGAGNAATTGCNTCTCATTTGTCTGAGT  
AGTGTCAATCAATCTGGGGGTGGGTGGGGCAGNACACNAGGGGAAGATGGGAAACATACAGGCATGCTGGGGANGCCCGT  
GGNTCTATGNCTCNGAGGCGGAAAAACACTGGGGNCTAGGGGTACCCCAACCCCTGTACGGCCATAACNCGNGGTTTGTG  
GTACCCACTAACGTANNNTGCACCCCTACCCGNCCTTCNTTCTCCTCTTNCCTTCCGGTTCCCTCACCNAAACGGGCCCTTNG  
TCATATCTNGGNCCACCAATANAGTAGTCTTTGCCCCCAAGTCCCTNATGACCTNTAAGACCTTCANNANCCCCCTT  
NTTTAAANANCCNNNNNNNNNNCCNGNAAANAAACAACTAATTTTGGGAACCCCCCCCNANAAACCCCTTTCC  
NTNTTCCCCCNATTTAATNTTNNNTNCCCCCCCCCCCCCNNTTTTNNCNCNNNNN

FIG. 13

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SEQ ID NO: 5

CNCCCCGCCCNNTTNAANAANCNCNAGCCCTCTGGCNAACTANANAACCACTGCTTACTGGCTTATCNAAAATTAATACGAC  
TCACTATAGGGAGACCCCAAGCTTTACTCGAACTGATGAGTCCGTGAGGACGAAANGCTGCTCTANANGGCCCTATTCTAT  
ANTGTCACCTAAATGCTAGAGCTCGCTGATCAGCTCGACTGTGCCCTTCTAATTGCCAGCCATCTGTTGTTGCCCTCC  
CCCGTGCCCTTCCTTGACCCCTGGAAGGTGCCACTCCCACTGTCCTTCCCTAATAAAATGAAGATNTTNCATCNCATTGTCT  
GAGTAAGTGTCAATCTATTCTGGGGGTGGGTGGGCACGACANCAANGGGAAGATTGGGAAAAAATANCAGGCNTGC  
TGGGGATNCCGTGGGCTCTATNGCTTCTGAAGCGGAAAAACAACACTGGGGCTCTANGGGGTATCCCCCCCCCTGTAAAC  
NGCATTAACNCGGGGTGTTGTGGTTACCCCAACTTAACGCTANCTGCAACGCCCNAAACGCCCNCCCTTCCCTTTCT  
CCCTTCCTTCNCCCCACTTTCGGGGTTCCTCCNTCAACCCNAAATCGGGGCCCCCTTAGGTCCAATTATGCTTCGGCCCCCNCCCN  
AAACTAATAGTNGGTTCTTTNGCC

FIG. 14

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SEQ ID NO:6 mouse rhodopsin

TCAGTGCCCTGGAGTTGCCGCTGTGGGAGCCGTCAGTGGCTGAGCTCGCCCAAGCAGCCCTTGGTCTCTGTCTACGAA

FIG. 15

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SEQ ID NO:7 m rho mut 1460

NNNNTCTCCNCTTTCGTTTGTGNANANTCANNAANANAGCGNCCCGGAAGGTGTCAGTGCCTGGAGTTGCGCTGTG  
GGACCCGTCANTGGCTGAGCTCGCCAAAGCAGCCTTGGTCTCTGTCTACGAAGAGCCCGTGGGGCAGCCTCGAGAGCCGCA  
GCCATGAACGGCACAGAGGGCCCCAATTTCATATGTGCCCTTCTCCAACGTACAGGCCGTGGTGCGGAGCCCCCTTCGANCN  
TCCGCAGTACTACCTGGCGGAACCATGGCAGTTCCTCATGTGGCAGCGTACATGTTCCCTGCTCATCGTGGGCTTCC  
CCATCAACTTCCTCACGCTCTACGTACCGTACAGCACAAAGCTGCGCACACCCCCCTCAACTACATCCTGGCTCAACT  
TGGGCCGNTGGGNTTGGAACCTCCTTCCCATTTGGGTCNTTCCCGGAANGGANTNCACCAACCCCTCTAACACATCAA  
CTCCCATGGGCTACTTCGTTCTTTTGGGGCCNCAGGCTGTTAATCTCGAAGGGCTTCTTTGCCACACCTTGGAAGTGAA  
ATCNCCCTGTGGTTCCCTGGTGGTCNTGGCCATTAAACGCTACTTGTGGTCTCTGCAACCCCAATAACAATTTC

FIG. 16

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SEQ ID NO:8 RIB33

TCCCCNNNTTTGTAGCNCTGCCAANAATAAGGCCAGCTCACAGGANAANTANANAACCCACTGCTTACTGGCTTANC  
NAAATTAATACGACTCACTATAGGGAGACCCCAAGCTTGGCACATCTGATGAGTCCGTGAGGACGAAAAAATTGGTCTACA  
GGCCCTATTCTATAATGTCACCTAAATGCTANAGCTCGCTGATCATCCTCNACTGTGCCCTTCTACTTGCCAGCCNCTCTN  
TTGTTGCCCTCCCCCGTGCCCTTCCCTTGACCCCTGGAAGGTGCCACTCCCACTGTCCCTTTCCTAATAAAATGAGGAAATT  
GCATCGCAATTGCTGAGTAAGTGTCATTCTATTCTGGGGGTGGGTGGGCAGGACNCAAGGGGAAGATTGGGAAAT  
ACAATANCCAAGGANCNCTCCCCNCGGTAATTGCGGATTNGGCTCTNTCGCTTCCCTAAGGCNGAAANAACAACCTNNG  
GCGCTNCGGGTTTCCCCCNCCNCCCTNTTAGCNGCGCATTANTCGCCGCGGTGTTGTTACTCCCCACCTNAACG  
CTACANTTGCCAGCGCCTAACGCCCCCCCCCTTNCNTTCTTCCCCCTCTCTCNCACTTCCCCGGCTTCCCCCNCCANCC  
NAAATCNGG

FIG. 17

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SEQ ID NO:9 HUM RDS

NNTTGTGTCAGTNGGATGTCTATATAAGCAGAGNCTCTGGCTAACTAGNAGAACCCACTGCTTACTGGCTTATCGAA  
ATTAATACGACTCACTATAGGGAGACCCCAAGCTTGGTACCGAGCTCNGATCCACTAGTAAAGGCCGCCAGTGTGCTGGAA  
TTCCTCAGCGCCACGACCAAGTACTATCCCCCTGCTCAAGCTGTGATTCGAGACCCCTGCCACCACTACTGCATTACAG  
GGGATCCCAAGCTAATGGGACTCGACATGGGTGCCCCACGGCANCTCCCTACANCTTGGCCANCTNCACTTTTCCCC  
AAAGNCCTAAATCTCCGCCCTCTCGGCTCNTTAANGTTNGGGTGGGGANCTGTGCTGTGGGAAACAACCCAGAAANACT  
TGGGCAGCATGGNGCTACTGAAAGTNCATTTTGAACAGAAACGCTCCANTTTGGCCCCAAGNNCNGNTCCCTAAANT  
GGTCTCCNTNTTTGGTNGNNTCCNCNCTTTCCNCTNGGAATGTTCCTGAAAAATTNAACNCCAAAAAGAACAAATTG  
AAAAATANTTCTNAAAAACCCCTTTTGTNNCCCCCCCCCNAAAAAGGGAAGGGNNGNCCCTTTTNTTCCCCCCCCGGG  
GGGAAAAATTTNNNNAANCCCCCCCCCCTTTTNA

FIG. 18

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SEQ ID NO:10 h per mut 257

TTATACNACACTATANGGAGACCAAGCTTGGTACCGAGCTCGGATCCACTAGTAACGGCCGCCAGTGTGCTGGAATTC  
TTCANCGCCAGGACCAAGACTATCCCTGCTCAAGCTGTGATTCGAGACCCCTGCCACCACTACTGCATTACGGGGG  
ATCCAGGCTAGTGGGACNCGACATGGGTATCCCCAGGCGAGCTCCCTACAGCTTGGGCCATCTGCACCTTTTCCCAAGG  
CCCTAAGTCTCCGCCTCTGGGCTCGTTAANGTNTGGGTGGGAGCTGTGCTGTGGGAAACAACCCGGACTACACTTGGCA  
AGCATGGCGCTGCTGAAAGTCAAGTTTGAACAGAAAANGGTCAAGTTGGCCCAAGGGCTCTGGCTCAGGAAACTGG  
GTTNCCCNCCNNGTTTNGGTTTGGNTGCATCANCTNCCAAAANANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN  
NN  
NN  
NN

FIG. 19



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SEQ ID NO:13 h per mut (359)

TTTTTNTGGNTNTCNAATTAAACGACTCACTATAGGGAGACCCAAAGCTTGGTACCGAGCTCGGATCCACTAGTAACGGC  
CGCCAGTGTGCTGGAATTCTTCANCGCCAGGACCAAGACTATCCCTGCTCAAGCTGTGATTCGAGACCCCTGCCACC  
ACTACTGCATTACCGGGGATCCCAGGGCTAGTGGGACTCGACATGGGTAGCCCCAGGCGAGCTCCCTACAGCTTGGGCCA  
TCTGCACTTTTCCCAAGGCCCTAAGTCTCCGCCCTCTGGGCTCGTTAAGGTTTGGGTGGGAGCTGTGTGGGAAGCAA  
CCCGGACTACACTTGGCAAGCATGGCGCTACTGAAAGTCAAGTTTGACCCAGAAAANCGGGTCAAGTTGGGCCCAAGGGC  
TCTGGGCTCNATGNAACCTNNGGTTTCCCCCCCCCTNTTTGGGCTGGGCATCATCATCTTCAGCCTGGGANTGTTCTG  
AANATTGAACCTCCCAAAGAGANCGATGTGATGAATAATTCTGAAANCCATTTTGTGCCCCACTCATTTGANAAGGANGGG  
TGNATCCTGTTTCTTCACTCCCTGNTGGAAAATGCTACAANCCCTGAACC

FIG. 20

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SEQ ID NO:14 rib30

CNTTGGTGGTNCGTGTCGGNTGTCTATATAAGCAGAGCTCTCTGGCTAACTAGAAAGAACCCACTGCTTACTGGCTTATCGA  
AATTAAACGACTCACTATAGGAGACCCAAAGCTTACTTTCAGCTGATGAGTCCGTGANGACGAAAGCGCCATCTAGAG  
GGCCCTATTCTATAGTGCACCTAAATGCTAGAGCTCGCTGATCAGCCCTCGACTGTGCCCTTCTAGTTGCCAGCCATCTGT  
TGTTGCCCCCTCCCCGTGCCCTTCCCTTGACCCCTGGAAGGTGCCACTCCCACTGTCCCTTCCCTAATAAAATGATGAAATTG  
CATCGCAATTGCTGAGTAGGTGTCAATTCTATTCTGGGGGTGGGTGGGCANGACANCAAGGGGGAAGATTGGGAAAAACA  
ATNCCCGCCTGCTGGGGATGCGGTGGGCTCTATGGCTTCTGAGGCGAAANAACNNCTGGGGTCTNNGGGGTTCNCCNCCCC  
CCTGTNNCGCCTTNANNCGGGGTCTTGTGNTCCCCCCTTANCNNTTNNNNNNCCNCCCNNTNCNNTT  
NNTCCNNNNNTNCNCNNNTTNNNNNGNNTCCNNNNNNNTNNNNNGGGGCNCCNNNGTCCNNTNNNNCCNCCNNNNNC  
NNCNCNNNNNTNTGNGGCCCNCCNNCNCNNNNNCNCN

FIG. 21

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SEQ ID NO:15rib31

NNTTNTCCTACGNCCGTTTAAANANAACAGACCCCTCTGGANAATTANATNNCCACTGCTTACTGGCTTATCGAAATC  
AATACGACTCACTATANGGAGACCCCAAGCTTACAGTCCCTGATGAGTCCGTGAGGACGAAAGGCTGAATCTANAGGGCCC  
TATTCATAGTGCACCTAAATGCTAGAGCTCGCTGATCAGCCCTCGACTGCGCTTCTAATTGCCAGCCATCTGTTGTTT  
GCCCCCCCCGTGCCCTTCCCTTGACCCCTGGAAGGTGCCACTCCCACTGTCTCTNTCCCTAATAAATGATGANNTTGCATCG  
CATGTCTGAGTAAGTGTCANTCTATTCTGGGGGTGGGTGGGCGANGACANCAAGGGGAAGATTGGGAAAAACATTN  
CACGCATGCCGGGGATGCGGTGGGCTCTNTTNGCNTCNGAAGCNGAAAAACNACTGGGGCCCTANGGTTNNCCNN  
TCCCCCNTGTAAACNGNCCTTNAACNCGGGGTTTGTGGTTNNCCNANCTTANCNCTNAACTTCCNNCCCCNNCCCCCNC  
TCTTCCCTTTTCCCTCCATCTCCNCNTTTNCCCGNTCTCCCTTNCACTNAAATGGGGGCCCCACNGGNCNTNTNTCT  
CTTNNNNCCNCCCNANANATATNCTNGTNTNNTTCNCCTCTCGGGCCCT

FIG. 22

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SEQ ID NO:16 PCR3 polcolla2

NTCNCGNCATTTAANCAGGCCAGGNC TACCGC NNGGTCCANGTAGGCCGGGAGCCCCAGCAACGCCGGGAAGGCCAGCAG  
CACCTTGGCACCAAGTAAAGCCGTTTGCTCCAGGATTACCANAGAGTCCAACGGGGCCGGAGAGGCCTGGAANACCACTT  
CACACGGGGAACCGCGGTCCAGTAGGACCAAGCTTACCAACAGCTCCAATTCAACCTTGGGGCCAGGGCACCTGG  
GAAGCCTGGANGGCCAGCAGACCAATGGGACCAAGCAGGACCAACGACCACTTCCATCACTGCTTTNGCNCAGCTGGGC  
AAGGGCACAACACTTCTCTCACANGAACCCACGGCTCCTGTTTNACTGAATCCATTTACAGGGCACAGTTCACCTT  
CACACAAGAACACCGNTGTCCCTTCATCATCAGACATGTTCCCTAATGCTTGAGCAGANTCAGATTCAGGAAACACACAC  
CTTTGTCCACATCTCTNCACAGTCTCGGTTTCAGGTACACTCCCACCTGCAGAGGCACTGACCAACCTGAGACATTGACA  
TTNCAGNCCACAGTCTGAAC TGAGCGGGCACGCCATGGC NAGTCATACCTGTCA GNATCATCTCTCTTANCATTC CCAA  
NGGCAGAA TGAAAGCTGACTCCCCAATGTCTTATTTTAANNANGGTTTNA AANNNNNNNNNNNNNNNNNNNNNC  
CCCCCCCCCTTNGGGTTTATATATCTATNCNCCCNCTNGGATATCTTTNCCCCCTTNCCCCCTNAAANTTTTNTTTT  
TNNNN

FIG. 23

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SEQ ID NO:17 tot polcolla2

CCCTTTAAACANGGCCAGGAATACCGCGGGGTCCAGGGAGGCGGGACCCCANCAACGCCGGGAANGCCAGCAGCACC  
CTTGGCACCAAGTAAAGCCGTTTGCTCCAGGATTACCAAGGAGGTCCAACGGGGCCGGAGANGCCTGGAAGACCACTTCACC  
ACGGGAACGCGGACCAAGCANGACCAAGCGTTACCAACAGCTCCAATTTCACCCCTTGGGGCCAGGGCACCTGGGAAGC  
CTGGANGGCCAGCAGACCAATGGGANCAAGCAGGACCAACACTTCCATCNCCTGCCNCTGGCACCAAGCTGGGCAA  
GGCACAAACACTTCTCTCTCACNAAGAACCCACGGNTCCGTGTTAACTGAATTCCATTTCACAGGGCACAGTTCACCTTC  
ANACAGAACACGGGTGTCCCTTCATCATCAAAACATNTTCCCTATNCCCTTGAGCAGAAATCAGATTGAGGAACACACACTTG  
TCACATCTCCCTCACAGTCTCGGTTTCAGGTAACACTCNCACCTGCAGAGGCCACTGACNAANCTCAGANATTTANATTCCN  
CTCCNCAAGTTGAAGTTAGCGGGCCCTNNCATTTGGNTTGTCTTAACCTNNGGGGTTTNNCTNNNNNNNNNTTT  
NACNANTCCCAANGGGGANAANAGNTGACTCCTATGTCTTNTNTNAAAAGGTTTTTNAAAAATTAACCCCCCCCCCTN  
TTGGGTATTATTATTTTTTTNNCCCCCCTTTTNGGAANCNTNNCCCCNTTTTCCCCNNNAAANTTTTTTNTTTTTTT

FIG. 24

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SEQ ID NO:18 RIB908

NCTTTCNNTCTNATNCATANAAGCAGGCCCTCTNNAAAACTANANTTCCACTGCTTACTGGCTTATCGAAANCAATAC  
GACTCACTATAGGGAGACCCAGCTTCGGCGGCTGATGAGTCCGTGAGGACGAAACCAGCATCTAGAGGGCCCTATTCTTA  
TAGTGTCACCTAAATGCTAGAGCTCGCTGATCAGCCTCGACTGTCCTTCTAGTTGCCAGCCATCTGTGTTTGCCCTC  
CCCCGTGCCCTTCCCTTGACCCCTGGAGGTGCCACTCCCACTGTCCTTTCCTAATAAATGANGAAATTGCATCGCATTTGTC  
TGAGTANGTGTCAATTCTATCTGGGGGTGGGTGGGCANGACANCAAGGGGAAAGATTGGGAANACAATAACAGGCAT  
GCTGGGATGCGGTGGCTCTATGGCTTCTGAGCGGAAAGAACCAACTGGGCTCTANGGGTATCCCCACNCCCCTGT  
TACCGGCGCATTAANCGCGGGGTGTTGTGTTACCCNCAACTTAACGCTACACTTGCCACGCCCTAACGCCCTCCCTTC  
GCTTCTTCCCTTCTCCCACTTCCCCGNTTTCCTTCAACTCTAATCGGGCNCCTTAGGTCCAATTAATCTTACGGN  
CNCACCCAAACTNATAGTAAGTCCTTNTGGCCCCCCCCAAAAGGTTCCCCCTAAATG

FIG. 25